

REMARKS

Claims 1-11 are pending in the present application. No claims have been amended in this response.

Rejection under 35 U.S.C. § 102(e) or 35 U.S.C. § 103(a)

Claims 1-4 and 6-11 stand rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US Patent 6,656,633 B2 to Yamakawa et al. (hereinafter “Yamakawa”). Applicants respectfully traverse.

Applicants submit that Yamakawa is directed to a binder for an electrode for a lithium ion secondary battery. On the other hand, the present invention is directed to a binder for an electrode for an electric double layer capacitor. In the lithium ion secondary battery and the electric double layer capacitor, the charge and discharge systems are different from each other. In the lithium ion secondary battery, the charge and discharge is conducted by an electrochemical reaction wherein lithium ion in an electrolytic solution is exchanged between positive electrode and negative electrode. Meanwhile, in the electric double layer capacitor, the charge and discharge is conducted physically, meaning the system can physically acquire electric charge by absorbing and desorbing ions in an electrolytic solution onto an electrode with an electric pressure between the electrodes. By having positive and negative charges arranged in an opposite position with a very narrow clearance at the interface between electrode and electrolytic solution, this system of Applicants' binder for electric double layer capacitor can realize significant charge and discharge in a moment of time.

As explained above, a binder having such a system can realize the significant charge and discharge in a moment of time in the electric double layer capacitor (e.g., see claim 11). However, this causes a swelling to the electrolytic solution of the binder of the electrode having a significant influence on battery characteristics. In order to solve the swelling problem, Applicants have invented a binder composition preferably used for an electric double layer capacitor.

With regard to claims 7 and 8, Yamakawa does not teach or suggest the claimed method of producing an electrode for an electric double layer capacitor. As explained above, Yamakawa is directed to a binder for an electrode for a lithium ion secondary battery. On the other hand, the present invention is directed to a binder for an electrode for an electric double layer capacitor. During examination, statements in the preamble reciting the purpose or intended use of the claimed invention must be evaluated to determine whether the recited purpose or intended use results, in the case of process claims, in a manipulative difference between the claimed invention and the prior art. If so, the recitation serves to limit the claim. *See* MPEP § 2111.02(II). Here, Applicants submit that there is a manipulative difference between the recited electric double layer capacitor and the lithium ion secondary battery as disclosed by Yamakawa. Accordingly, Yamakawa cannot be properly applied against claims 7 and 8.

The electrolytic solution used for the electric double layer capacitor and the lithium ion secondary battery are different from each other. Applicants have surprisingly developed a

binder composition which can solve the swelling problem, and discovered a binder composition comprising monomer units (a), (b), and (c) below.

monomer unit (a) : derived from a compound represented by the following general formula : $\text{CH}_2=\text{CR}^1-\text{COOR}^2$ (1);

monomer unit (b) : derived from an α , β - ethylenically unsaturated nitrile compound; and

monomer unit (c) : derived from a multifunctional ethylenically unsaturated carboxylic acid ester.

There exists in Yamakawa a binder for the lithium ion secondary battery comprising (a), (b), and (c), however, the monomer unit (c) was not considered to be essential.

The binder in Yamakawa is experimentally used for the electric double layer capacitor, and the results are compared to the binder of Applicants' invention in attached experimental report. See **Experimental Report**. Binder No.1 is a binder composition of the present invention comprising monomer unit (a), (b), and (c). Binder No.2 is a binder of Yamakawa comprising three essential components described therein. Binder No.3 is the same binder as in example 1 of Yamakawa.

The attached experimental report was conducted by Mr. Yamakawa, who is an inventor of the present application. From this experimental report, it can be seen that when the binder of the present invention is used for the electric double layer capacitor (e.g., see claim 11), a swelling of the binder was significant and a discharge capacity is significantly decreased. Applicants believe that the multifunctional ethylenically unsaturated carboxylic acid ester produces a cross-linking structure in the binder. Therefore, the swelling of the

binder in the electrolytic solution is suppressed, and the deterioration of the discharge capacities is prevented. Thus, given the superior and unexpected results of the present invention, Applicants respectfully request reconsideration and withdrawal of the outstanding rejection.

Rejection under 35 U.S.C. § 103(a)

Claim 5 stands rejected under 35 U.S.C. 103(a) as obvious over Yamakawa in view of JP 08-10747 to Kasuke (hereinafter “Kasuke”). Applicants respectfully traverse.

As discussed above, the present invention is surprisingly superior to Yamakawa. The Examiner turns to Kasuke to establish that the carbonaceous material comprises active carbon having a specific surface area of 30 m² or more. However, Applicants respectfully submit that the outstanding rejection cannot be maintained, in light of the superior and unexpected results of the present invention. Accordingly, Applicants request reconsideration and withdrawal of the outstanding rejection.

In view of the foregoing, Applicants believe the pending application is in condition for allowance. A Notice of Allowance is earnestly solicited.

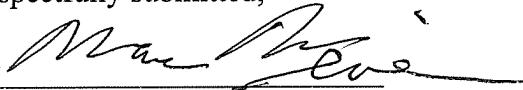
Conclusion

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Monique T. Cole, Reg. No. 60,154 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

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Respectfully submitted,

By 

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Attachment: **Experimental Report**